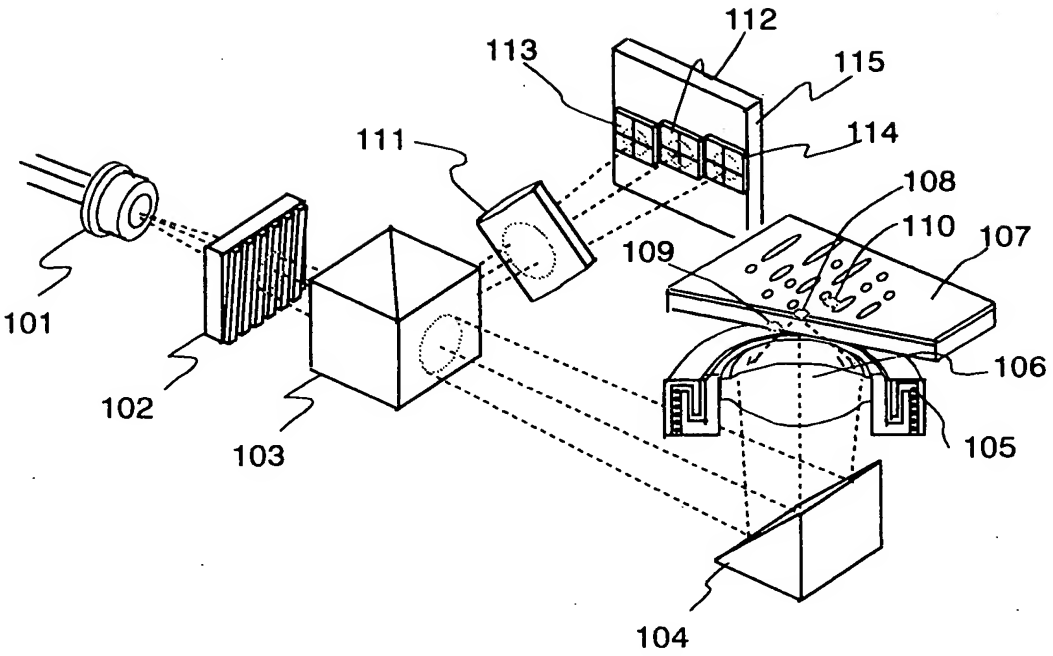

112
113
115
114
111
108
110
107
109
101
106
102
105
103
104

Fig. 1

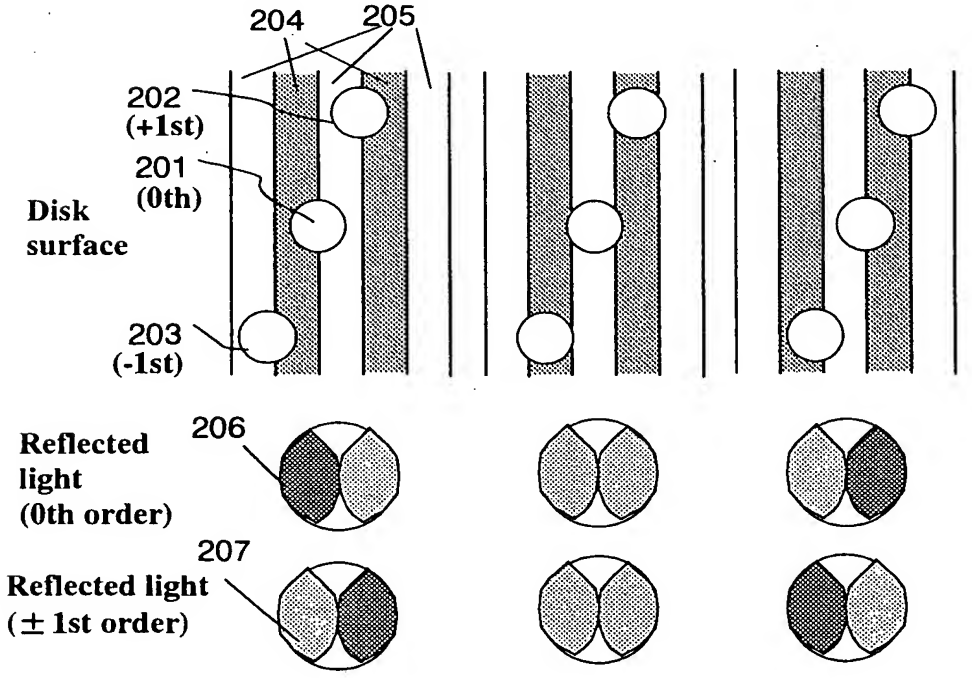

204
205
202
(+1st)
201
(0th)
Disk
surface
203
(-1st)
206
Reflected
light
(0th order)
207
Reflected light
(± 1st order)

Fig. 2

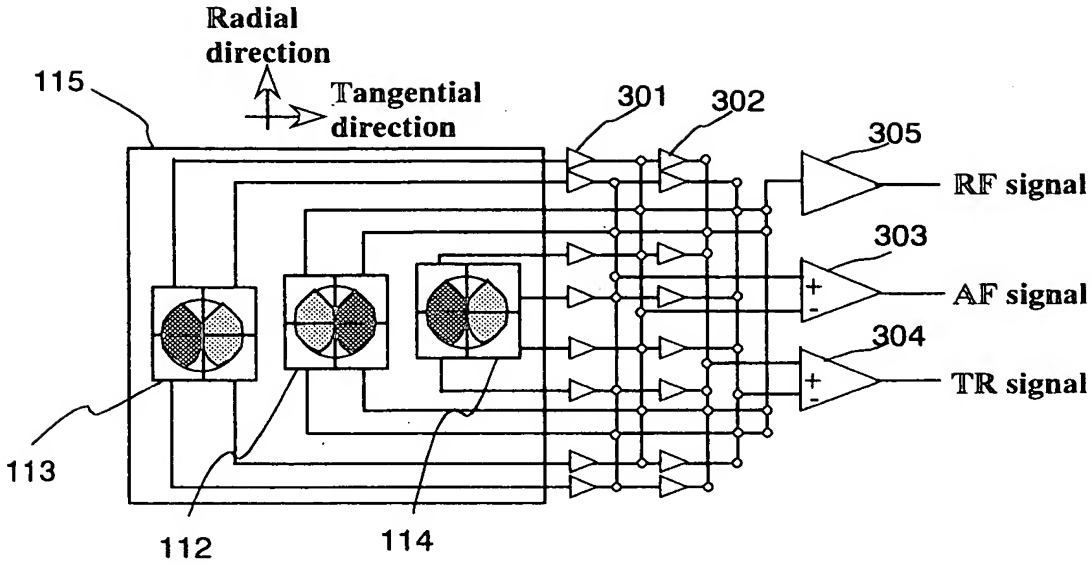

Radial direction
Tangential direction
115
301
302
305
RF signal
303
AF signal
304
TR signal
113
112
114

Fig. 3

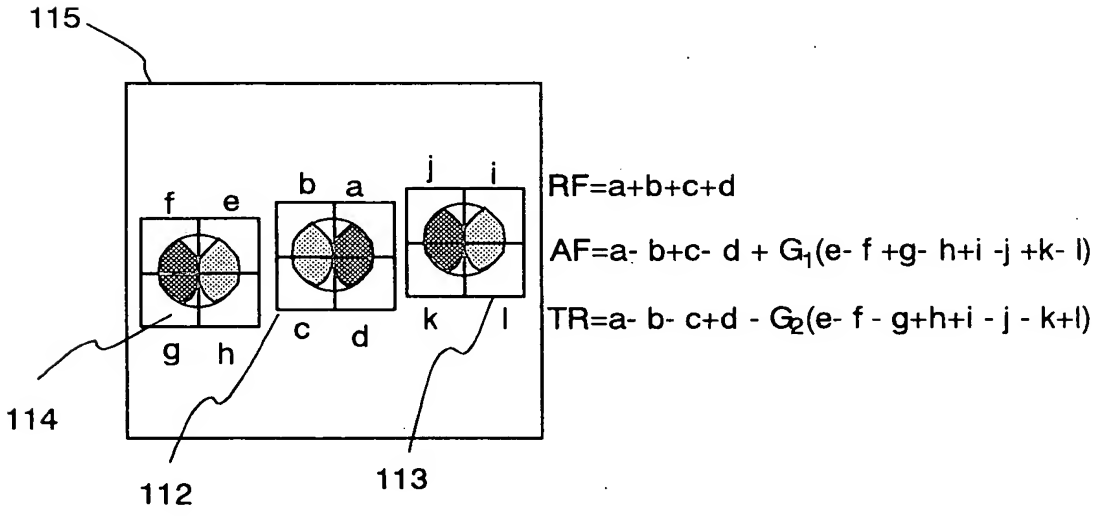

115
f e
b a
j i
g h
c d
k l
RF=a+b+c+d
AF=a- b+c- d + G1(e- f +g- h+i -j +k- l)
TR=a- b- c+d - G2(e- f - g+h+i - j - k+l)
114
112
113

Fig. 4

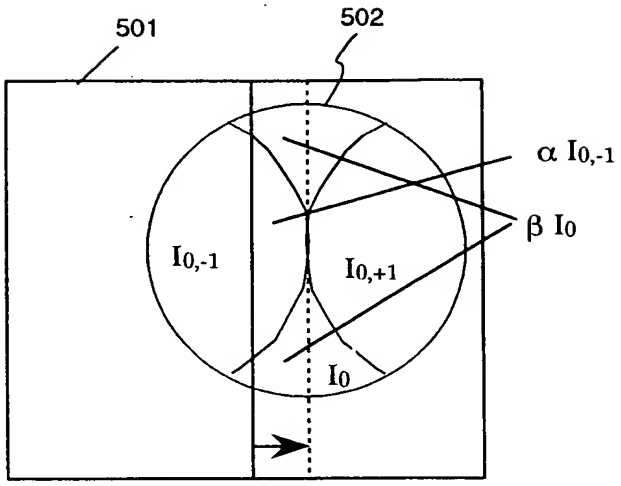


Fig. 5

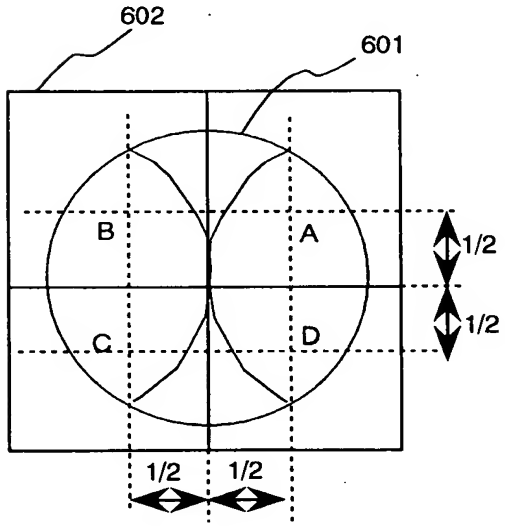


Fig. 6

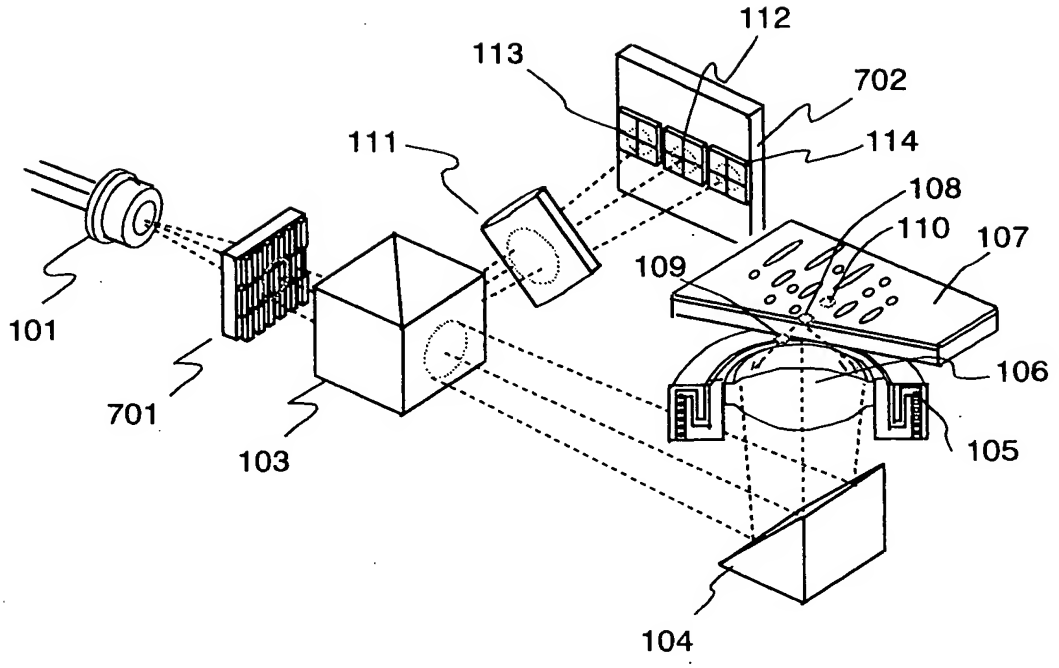

112
113
702
111
114
108
110
107
109
101
106
701
103
105
104

Fig. 7

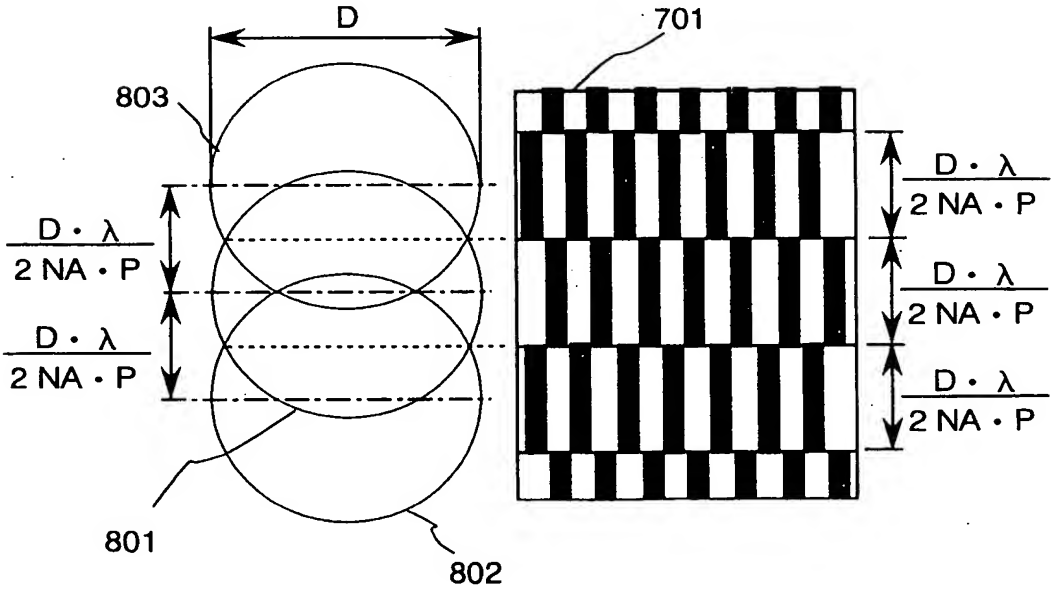

D
701
803
D · λ / 2 NA · P
D · λ / 2 NA · P
D · λ / 2 NA · P
D · λ / 2 NA · P
D · λ / 2 NA · P
801
802

Fig.8

FIG. 9

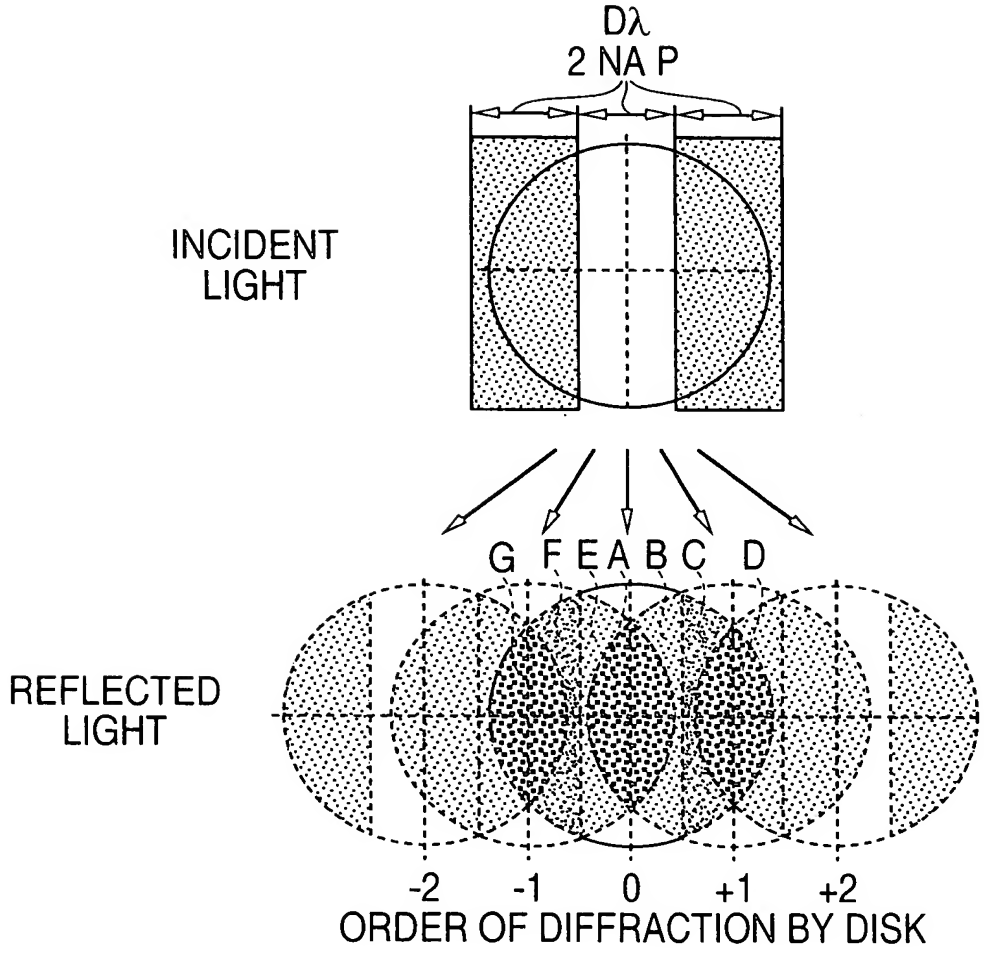


FIG. 10

CHANGES OF PHASE DIFFERENCE OF INTERFERENCE BY PHASE FILTER

INTERFERRING DIFFRACTION ORDER		REGION						
		a	b	c	d	e	f	g
0	-2	-	-	-	-	-	-	0
	-1	π	-	-	-	π	π	π
	1	π	π	π	π	-	-	-
	2	-	-	-	0	-	-	-
-1	-2	-	-	-	-	-	-	π
	1	0	-	-	-	-	-	-
1	2	-	-	-	π	-	-	-

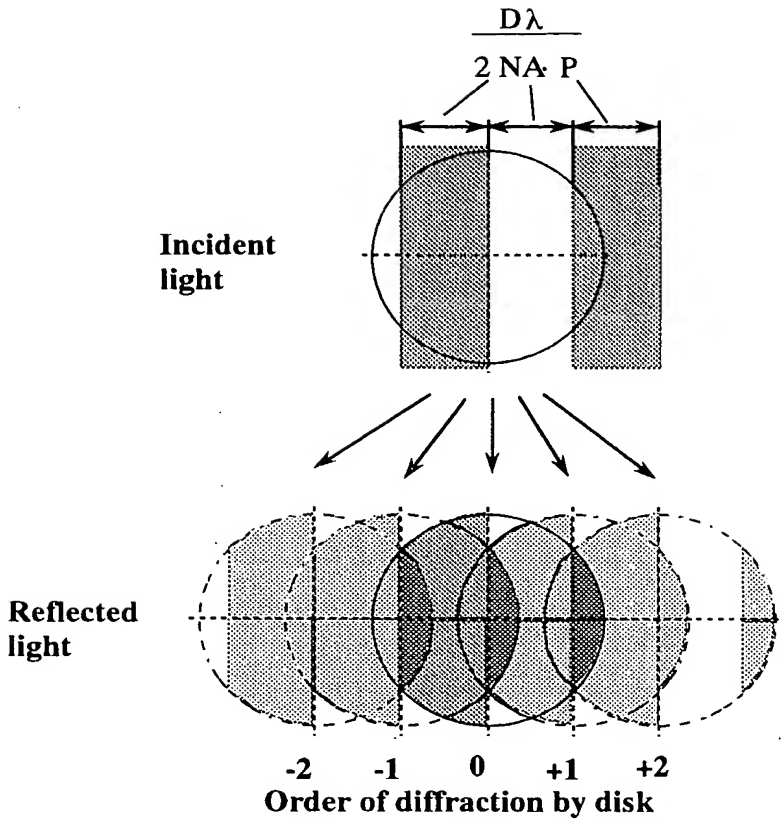

Dλ
2 NA· P
Incident light
Reflected light
-2
-1
0
+1
+2
Order of diffraction by disk

Fig. 11

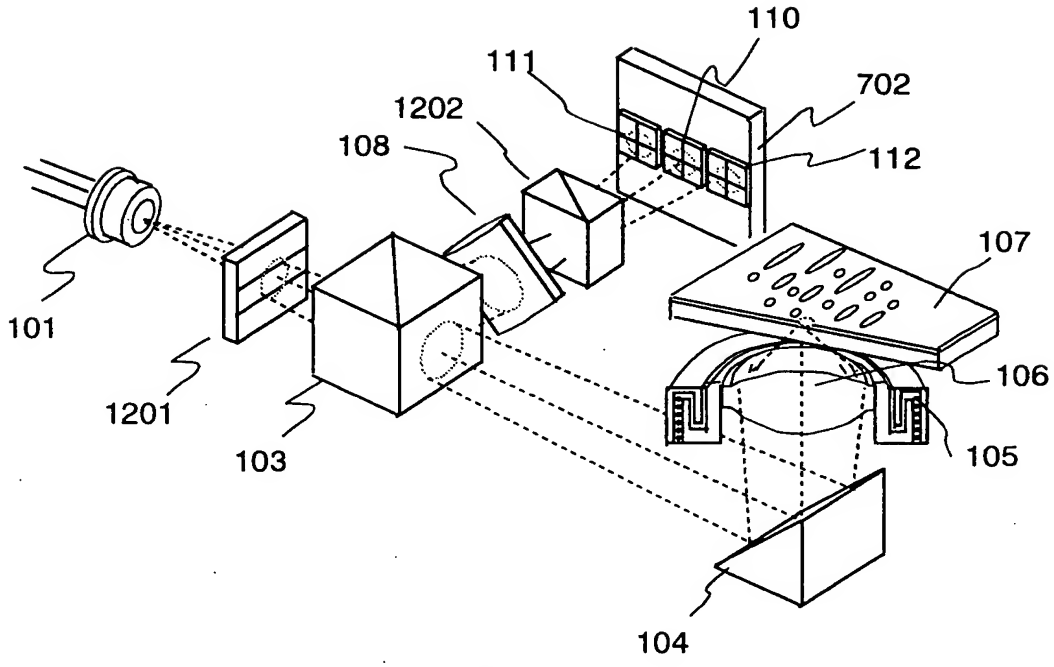

110
111
702
1202
108
112
107
101
106
1201
105
103
104

Fig. 12

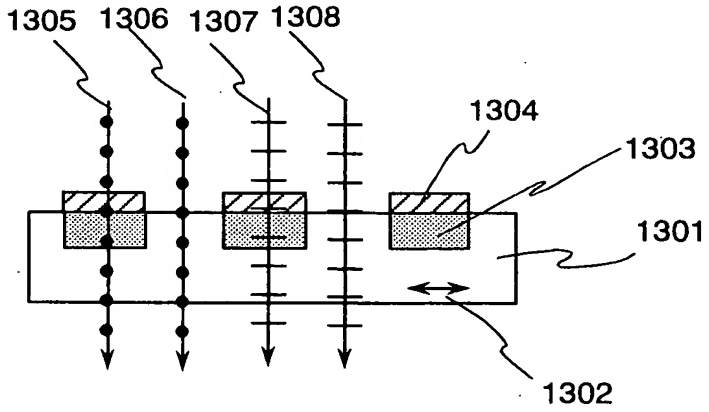

1305
1306
1307
1308
1304
1303
1301
1302

Fig. 13

FIG. 14

NA:0.6, WAVELENGTH:0.66 μm, TRACK PITCH:1.48 μm
DISK:LAND AND GROOVE, ASTIGMATISM:0.2λ (-45°),
SPHERICAL ABERRATION:-0.47λ,
DETECTOR DEVIATION:5 μm(DISK RADIAL DIRECTION)
FOCAL LENGTH OF DETECTION LENS:22.5mm,
ASTIGMATIC DISTANCE IN DETECTION OPTICS:0.9mm

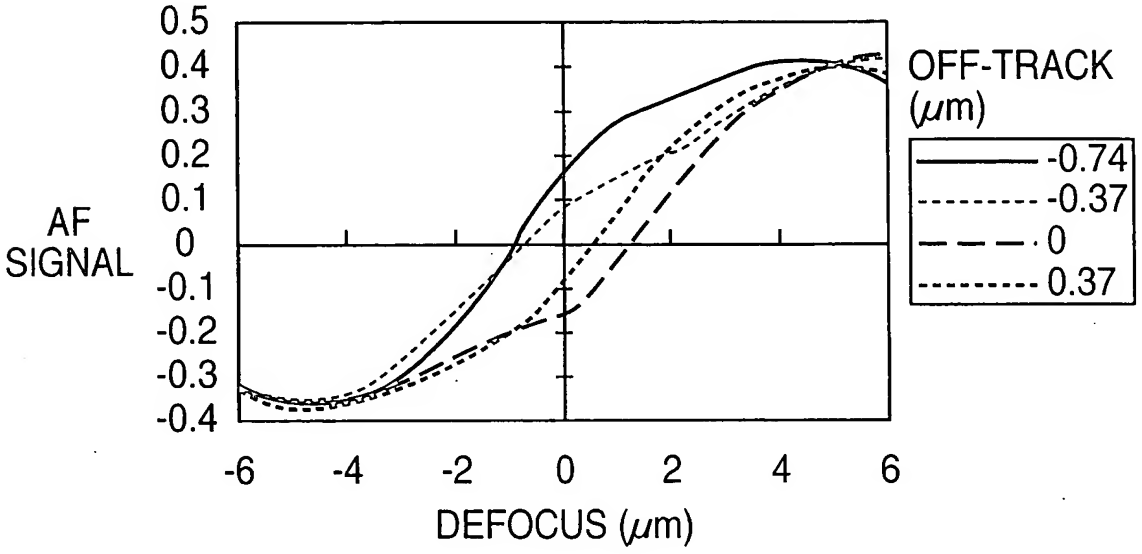
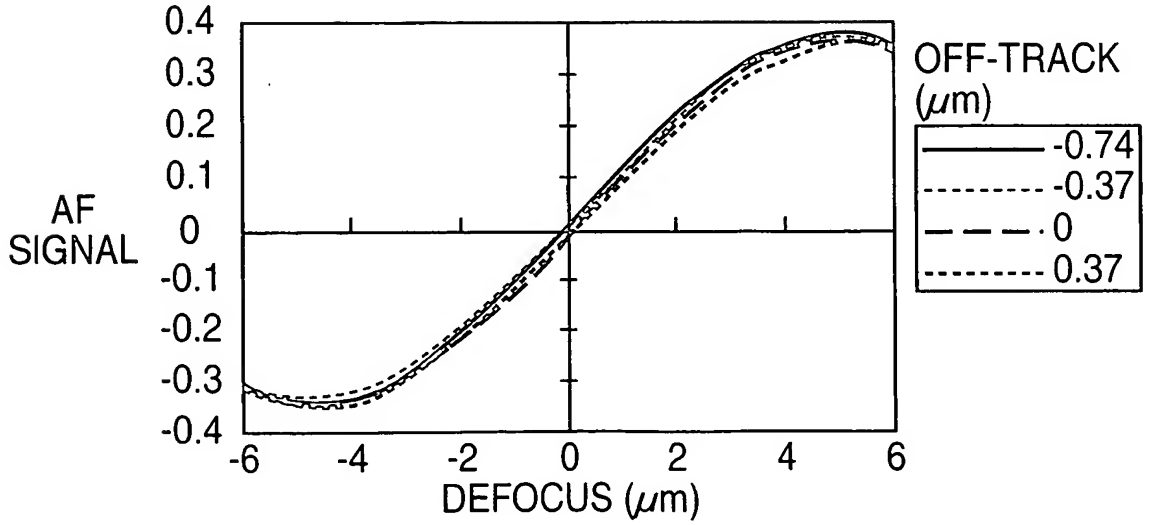


FIG. 15



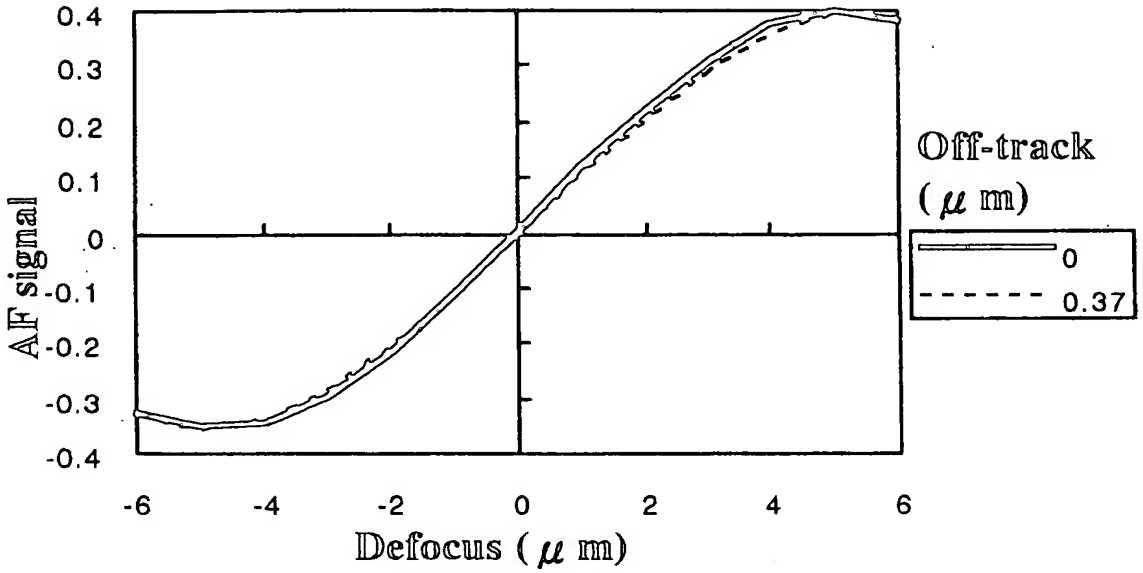

0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
AF signal
-6
-4
-2
0
2
4
6
Defocus (μ m)
Off-track
(μ m)
0
0.37

Fig. 16

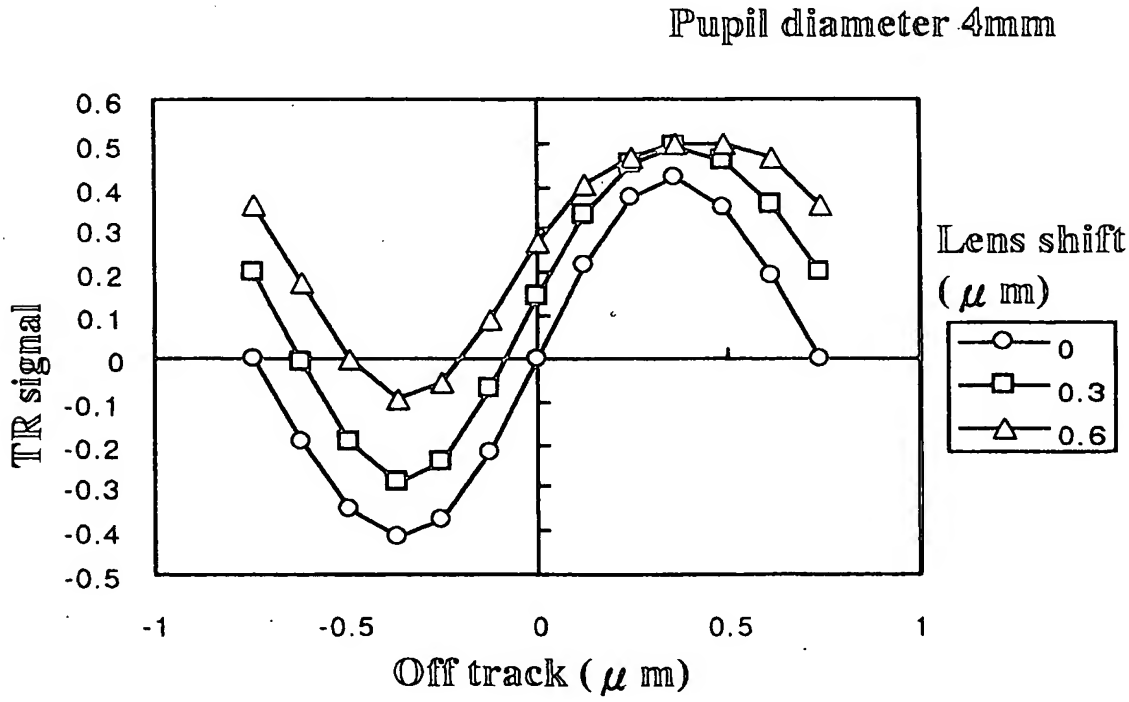

Pupil diameter 4mm
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
TR signal
-1
-0.5
0
0.5
1
Off track (μ m)
Lens shift
(μ m)
0
0.3
0.6

Fig. 17

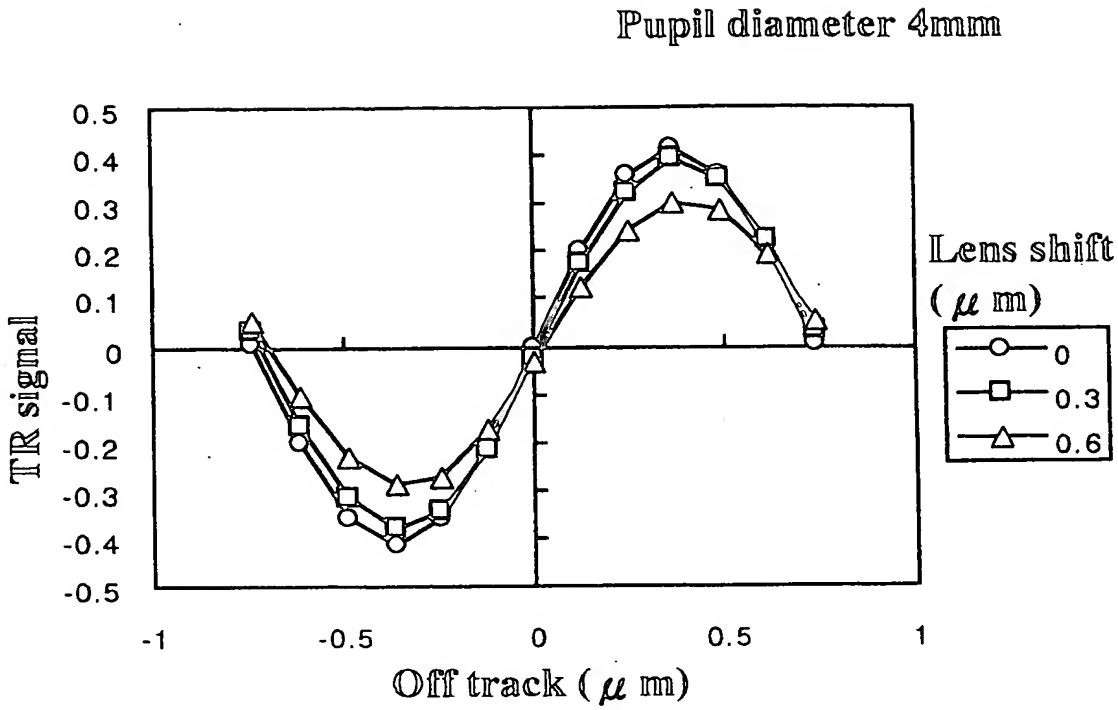

Pupil diameter 4mm
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
TR signal
-1
-0.5
0
0.5
1
Off track (μ m)
Lens shift
(μ m)
0
0.3
0.6

Fig. 18

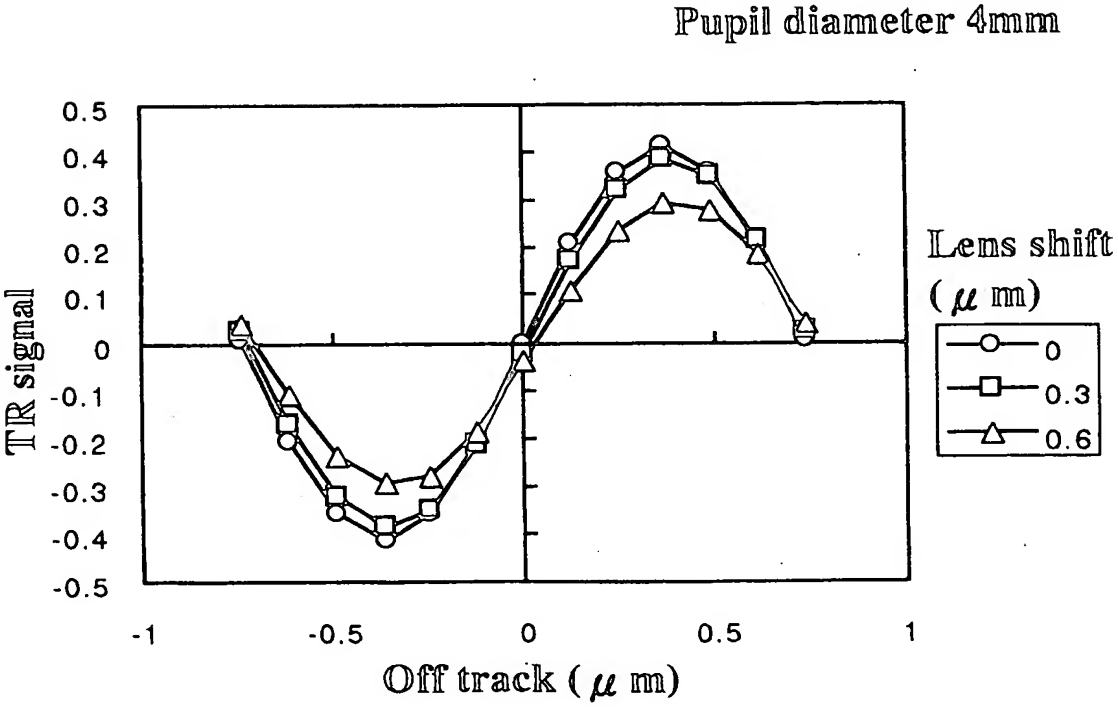

Pupil diameter 4mm
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
TR signal
-1
-0.5
0
0.5
1
Off track (μ m)
Lens shift
(μ m)
0
0.3
0.6

Fig. 19

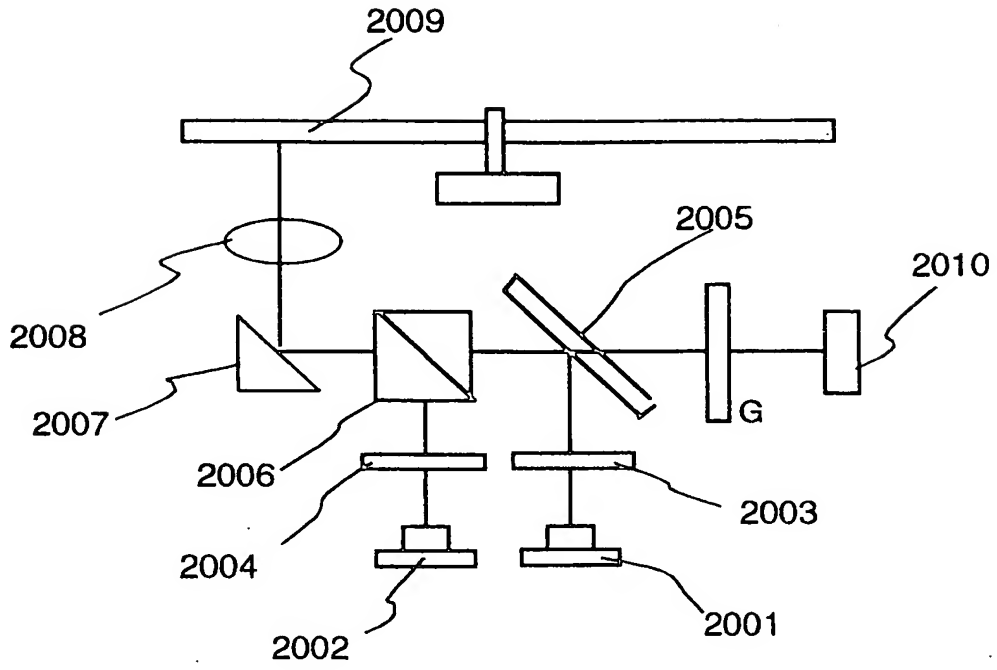


Fig. 20

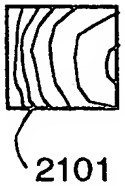
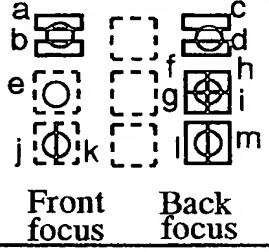
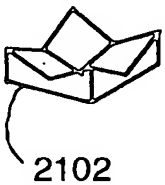
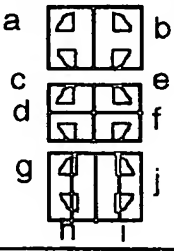
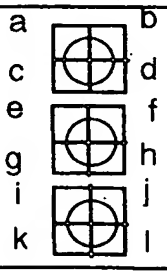
AF signal	G (in Fig.20)	Detector pattern	Operation method
Beam size detection	 2101	 Front focus Back focus	AF=a+b-c-d PP=f+g-h-i- α (l+m) DPD=f+i-h-g RF=e+f+g+h+i 3S-TR=c+d-l-m (α :constant)
Double knife edge	 2102		AF=g-h-i+j PP= α (a-b)-(c+d-e-f) DPD=c-d-e+f RF=c+d+e+f 3S-TR=a+b-g-h-i-j (α :constant)
Astigmatism	No		AF=e+h-f-g+a+d-b-c PP= α (a+b-c-d)-(e+f-g-h) DPD=e+h-f-g RF=e+f+g+h 3S-TR=a+b+c+d-i-j-k-l (α :constant)

Fig. 21

FIG. 22

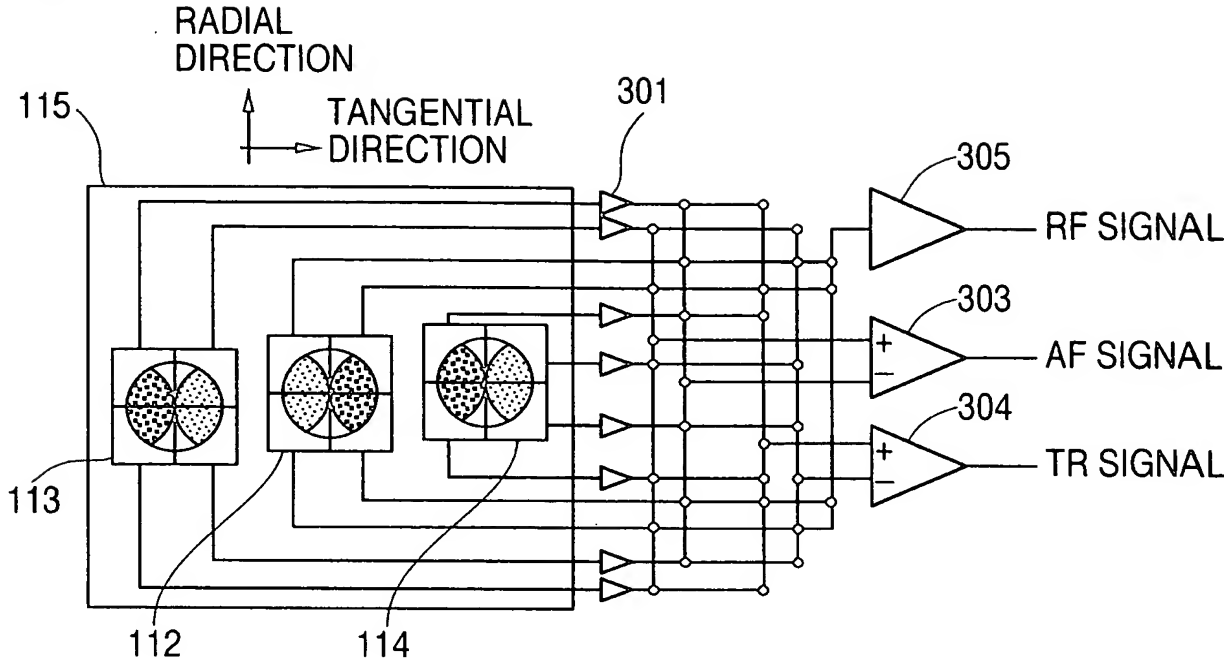
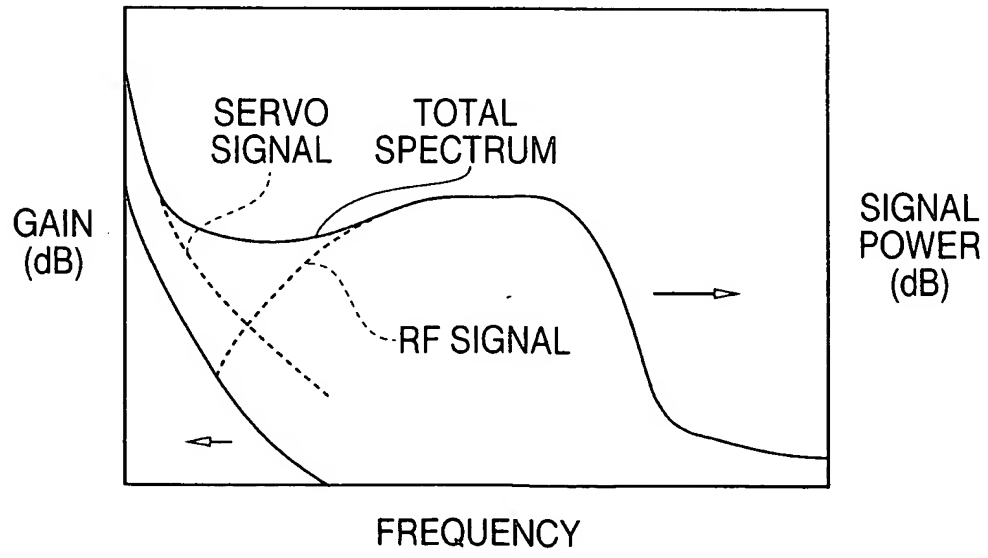

RADIAL DIRECTION
TANGENTIAL DIRECTION
115
301
305
RF SIGNAL
303
AF SIGNAL
304
TR SIGNAL
113
112
114

FIG. 23


SERVO SIGNAL
TOTAL SPECTRUM
GAIN (dB)
SIGNAL POWER (dB)
RF SIGNAL
FREQUENCY